



Attorney Docket No. JP919990123US1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s): E. Colgan et al.
Docket No.: JP919990123US1
Serial No.: 09/662,192
Filing Date: September 14, 2000
Group: 2871
Examiner: Prasad R. Akkapeddi

I hereby certify that this paper is being deposited on this date with the U.S. Postal Service as first class mail addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Signature: Levam. Kahn

Date: March 24, 2003

Title: Liquid Crystal Light Valve and Method for Producing
Same, and Liquid Crystal Projection Display Device

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RESPONSE TO OFFICE ACTION

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Office Action dated October 23, 2002, Applicants submit herewith the following remarks:

REMARKS

The present application was filed on September 14, 2000 with claims 1-38. In the outstanding Office Action dated October 23, 2002, the Examiner has: (i) rejected claims 1-3, 5, 6, 12-14, 16, 17, 23-25, 27, 28 and 34-37 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,081,305 to Sato et al. (hereinafter "Sato"); (ii) rejected claims 4, 9-11, 15, 20-22, 26 and 31-33 under 35 U.S.C. §103(a) as being unpatentable over Sato, in view of U.S. Patent No. 5,056,895 to Kahn (hereinafter "Kahn"); and (iii) indicated that claims 7, 8, 18, 19, 29, 30 and 38 are allowable.

In this response, Applicants traverse the §102(e) and §103(a) rejections. Applicants respectfully request reconsideration of the present application in view of the following remarks.

Claims 1-3, 5, 6, 12-14, 16, 17, 23-25, 27, 28 and 34-37 stand rejected under §102(e) as being anticipated by the Sato reference. Specifically, with regard to independent claims 1, 12, 23 and 34-

36, the Examiner contends that Sato, with reference to FIG. 2, discloses a liquid crystal light valve comprising “a light blocking layer (163) formed below the light-reflecting films (140, 160 and 180)” and “light shields (163) provided on the light-blocking layer formed below the light-reflecting films (180)” (present Office Action; page 3, first paragraph). Applicants respectfully disagree with the Examiner’s contentions.

With regard to independent claims 1, 12, 23 and 34-36, Applicants submit that Sato fails to teach or suggest “a light-blocking layer formed below the light-reflecting films” and “light shields provided on the light-blocking layer,” as required by the subject claims. The Examiner analogizes the light-blocking layer and light shields to the shading layer 163 shown in FIG. 2 of Sato. However, Applicants disagree with this characterization of the prior art and submit that, in contrast to Sato, the light-blocking layer (20) and light shields (38) of the present invention are separate and distinct elements, as clearly shown at least in FIG. 1 and expressly set forth in the subject claims.

The present specification, at page 12, lines 21-23 and at page 14, lines 9-11, states:

The light-blocking layer 20 blocks the light from a light source. The layer 20 prevents a reflection of light transmitted to the light-blocking layer 20 and acts as an etching stopper for a light shield 38 which is to be formed afterward. (emphasis added)

Thus, the light-blocking layer and light shields are clearly formed separately and are distinct from one another. The specification further states that “the light shields 38 are each formed between the light-reflecting films 24 and the light-blocking layers 20 and along the inside peripheral portion of the light-reflecting films 24” (present specification; page 14, lines 9-11; emphasis added). Forming the light-blocking layer and light shields as separate elements in this manner advantageously improves the ability of the light valve to block “light incident from the space between light-reflecting films 24” (present specification; page 14, lines 21-22).

Applicants further submit that Sato fails to teach or suggest multiple insulating layers formed between the light-reflecting films and a light-blocking layer, as set forth in the subject claims. Thus, even assuming, *arguendo*, that Sato discloses a light-blocking layer, which the Examiner analogizes to layer 163 in Sato, and a plurality of light-reflecting films, which the Examiner analogizes to metal layers 180, 160, 140 in Sato, Sato still fails to teach or suggest forming at least two insulating layers between any pair of such light-reflecting films and light-blocking layer. Instead, Sato discloses only

a single insulating layer (170 or 150) formed between layers 180 and 163, or between layers 163 and 150, respectively.

With regard to independent claim 37, which is directed to a method of forming a liquid crystal light valve similar in scope to claims 1, 12, 23 and 34-36, Applicants submit that this claim is also patentable over the Sato reference. Specifically, Sato fails to teach or suggest, among other steps, "forming a stud in the hole in the light-blocking layer and in the grooves in the first and second insulating layers, said stud configured to electrically connect the light-reflecting films and the electric circuit," as recited in claim 37.

In contrast to the claimed invention, Sato discloses that electrical connection from the device 1a to the pixel electrode 181 is made by a series of connections of elements 141 formed of metal layer 140, element 164 formed of metal layer 160, and via hole elements 131, 151 and 171 (Sato; FIG. 2). A significant disadvantage of this structure is that in order to accommodate element 164, a larger opening in layer 170 is required, which can potentially leak more light compared to the structure formed in accordance with the claimed invention. In the structure formed by the method of claim 37, the stud (46) is not connected to the light-blocking layer (20) but, rather, passes through layer 20, and no equivalent to element 164 (in Sato) is present in the claimed invention.

Inasmuch as the Sato reference fails to teach or suggest the present invention as claimed, Applicants submit that independent claims 1, 12, 23 and 34-37 are patentable over the prior art. Accordingly, favorable reconsideration and allowance of these claims are respectfully solicited.

With regard to claims 2, 3, 5 and 6, which depend from claim 1, claims 13, 14, 16 and 17, which depend from claim 12, and claims 24, 27 and 28, which depend from claim 23, Applicants assert that these claims are also patentable over the prior art of record by virtue of their dependency from their respective independent claims, which are believed to be patentable for at least the reasons set forth above. Furthermore, these claims define additional patentable subject matter in their own right. Accordingly, favorable reconsideration and allowance of claims 2, 3, 5, 6, 13, 14, 16, 17, 24, 27 and 28 are respectfully requested.

Claims 4, 9-11, 15, 20-22, 26 and 31-33 stand rejected under §103(a) as being unpatentable over Sato, in view of Kahn. Specifically, the Examiner acknowledges that Sato fails to disclose the materials used to form the insulating layers and/or that the electric circuit formed in the substrate

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does not include a storage capacitance, as set forth in one or more of the subject claims. However, the Examiner contends that such limitations are disclosed in Kahn.

While disagreeing with the Examiner's characterization of the Kahn reference as applied to the subject claims, Applicants submit that claims 4 and 9-11, which depend from claim 1, claims 15 and 20-22, which depend from claim 12, and claims 26 and 31-33, which depend from claim 23, are patentable over the prior art of record by virtue of their dependency from their respective independent claims, which are believed to be patentable for at least the reasons given above. Moreover, these claims define additional patentable subject matter in their own right. Accordingly, favorable reconsideration and allowance of claims 4, 9-11, 15, 20-22, 26 and 31-33 are respectfully solicited.

In view of the foregoing, Applicants believe that pending claims 1-38 are in condition for allowance, and respectfully request withdrawal of the §102 and §103 rejections.

Respectfully submitted,



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